

CLAIMS

1. A protein consisting of the amino acid sequence of SEQ ID NO:1.
2. A protein consisting of the amino acid sequence of SEQ ID NO:1, except that the amino acid sequence contains one or more mutations.
- 5 3. The protein of claim 2, wherein the amino acid sequence contains between one and twenty mutations.
4. The protein of claim 2 or claim 3, wherein the mutation(s) reduce or eliminate ADP-ribosylating activity of the protein.
5. The protein of any one of claims 2 to 4, wherein the mutation(s) are independently substitutions,
10 insertions, and/or deletions.
6. The protein of claim 5, wherein the mutation(s) include single amino acid substitutions.
7. The protein of claim 5 or claim 6, wherein the mutation comprises one or more of the mutations listed in Table 1.
8. A protein comprising the amino acid sequence of a protein according to any preceding claim.
- 15 9. A protein comprising an amino acid sequence having greater than 50% sequence identity to the amino acid sequence recited between residue 410 and residue 604 of SEQ ID NO:1.
10. A protein comprising a fragment of 7 or more amino acids from a protein according to any one of claims 1 to 7.
11. A protein fragment of claim 10, wherein said fragment comprises at least one amino acid from
20 between residue 410 and residue 604 of SEQ ID NO:1.
12. A protein of any one of claims 1-10, wherein said protein is associated with at least one molecule of NAD, nicotinamide and/or ribosyl-ADP.
13. The protein of any preceding claim, for use as an adjuvant.
14. The protein of claim 13, for use as a mucosal adjuvant.
- 25 15. The use of the protein of any one of claims 1 to 11 in the manufacture of a medicament for raising an immune response in an animal.
16. An immunogenic composition comprising the protein of any one of claims 1 to 11 in admixture with an antigen.
17. Antibody which binds to the protein of any one of claims 1 to 11.

18. Nucleic acid encoding the protein of any one of claims 1 to 11.
19. Nucleic acid comprising the nucleotide sequence recited in SEQ ID NO:2.
20. Nucleic acid comprising a fragment of 10 or more nucleotides from the nucleic acid of claim 18 or claim 19.
- 5 21. A vector comprising a nucleic acid sequence of the nucleic acid of any one of claims 18-20.
22. A host cell transformed with the vector of claim 21.
23. A composition comprising the protein of any one of claims 1 to 11, the antibody of claim 17, and/or the nucleic acid of any one of claims 18-20.
24. The composition of claim 23 for use as a medicament.
- 10 25. Use of the composition of claim 23 in the manufacture of a medicament for treating or preventing bacterial infection.
26. The use of claim 25, wherein the bacterial infection is caused by *Listeria monocytogenes*.
27. Use of the composition of claim 23 in the manufacture of a medicament for treating or preventing listeriosis.
- 15 28. A method of treating a patient, comprising administering to the patient a therapeutically effective amount of the composition of claim 23.